

# System and method for product display, arrangement and rotation

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## RELATED APPLICATIONS

5 This application is a continuation in part of United States patent applications No. 10/392,162 filed March 18, 2003, and claims priority from that application.

This application is related to United States provisional patent applications No. 60/290969 filed on May 14, 2002; No. 60/292441 filed on May 19, 2002; and No. 60/400976 filed on July 28, 2002; and claims priority from those applications.

## BACKGROUND OF THE INVENTION

### 1. Field of the Invention

10 The invention relates to the display, arrangement and rotation of products such as those packaged in bottles, jars, cans, and boxes, and more particularly to an improved product display, arrangement and rotation system and method in which products displayed on a display shelf can easily be arranged or rotated to have the products' expiration dates kept safely up to date and to conveniently position the products manually near the front edge of the shelves for improved visual exposure and effortless selection by consumers.

### 2. Description of Related Art

20 Retail stores relying on the consumers to serve themselves have recognized the importance of displaying products near the front edge of display shelves so that the products can be readily seen by consumers and easily reached by the consumers. Customers typically remove products from the front of a display shelf, and products remaining toward the rear of display

shelves are often difficult to reach.

Well operated retail stores have clerks move around the store periodically to check the status of goods and to make appropriate corrections by moving products toward the front of display shelves. There is a need to make this alignment process more efficient.

5 The prior art provides some examples of automated or semi-automated shelf display alignment.

U.S. Pat. No. 6,155,438 to applicant describes a system and method for product display, arrangement and rotation. That patent includes a relatively fixed side frame which is typically held in place by magnetic attraction, and a pull frame attached to a rear member that is used to  
10 pull product forward on a shelf.

The '438 patent discusses prior art including U.S. Pat. No. 5,203,463 to Steven K. Gold which teaches the use of springs to push items to the front position on the display shelf; U.S. Pat. No. 5,240,126 to Foster which also uses a ribbon spring arrangement to advance a row of items forward; U.S. Pat. No. 5,240,125 to Kunz, which is similar to the '126 patent, with the addition  
15 of a protective wire grid to prevent a glass jar from falling out of the device; and U.S. Pat. No. 5,123,546 to Crum which also uses a spring mechanism.

Pending U.S. Patent Application Number 09/918,843 filed July 31, 2001 by applicant for "System and method for product display, arrangement and rotation" describes a device, system, and method for manually arranging products on a display with two slide rails which fit into the  
20 vacant spaces near the bottom of rounded container sides. In an alternate embodiment, a base is provided to elevate a row of containers, and the slide rails slide underneath the containers in the row. The slide rails may be attached to a rear member which engages the rear of the last product container in the row, and pushes the containers forward as the front member is pulled away from

the display shelf. The device may be a wire frame which may include side covers of various shapes and sizes. One embodiment of that base is a set of overlapping single display rows.

## SUMMARY OF THE INVENTION

5       The current invention relates to a device, system and method for displaying products generally forming a queue on a display surface such as a display shelf. Several embodiments of the invention relate to supporting merchandise on a display base.

In one embodiment, the base has a plurality of closely spaced product support ridges. The support ridges provide a strengthening of the base and provide a support surface for merchandise.

10       The valleys between the support ridges form recesses for the insertion of row dividers to define rows for the merchandise; and the valleys permit pull members to be positioned below merchandise.

In this invention, the term ridges refers to elevated elements integral to a display base which support merchandise above the base. The base typically rests on a shelf such as in a grocery store. Some of the spaces, or valleys, between adjacent ridges permit pull members to be placed below the merchandise so that merchandise will slide on the ridges above the pull member.

15       The ridges may have a variety of cross sectional shapes including triangular, flattened triangular, rounded, rectangular, or stepped. The ridges may include recesses to accept inserted row partitions, or a divider partition may be placed between ridges.

20       Row dividers may be provided by the ridges themselves, such as with a stepped ridge, or may be provided by divider partitions inserted into recesses in the ridges or between ridges. In some embodiments, the shape of the ridges is sufficient to separate rows of merchandise without

additional partitions. For many types of merchandise which have rounded or indented profiles in the lower portion of the container, a stepped ridge profile can be selected to fit into the recess formed between adjacent rows of containers, so that row division may be accomplished without requiring the additional shelf width of partition inserts. For retailers such as grocery stores that have precisely defined merchandising plans, this aspect of the invention permits the display base to be adopted without modification to the merchandising scheme.

The display base may be provided as a universal base such as regularly spaced rows, or the rows may be specifically designed to accommodate the actual row widths and profiles of particular merchandise. For example custom bases may be provided for rows of soup cans or jelly jars; or for rows of stacks of baby food jars. Merchandise is not limited to cans and jars, but may include a variety of shapes.

In one embodiment, the rear portion of the ridges may be marked or scored at one-inch intervals so that the base may be bent to a desired shelf depth. The ridges are formed so that every other ridge has a score line at a particular depth. This alternating scoring of the ridges provides a guide for bending the base to a desired width while maintaining a strengthened base.

In one embodiment, the base is cut to a desired depth and the flat rear portion of the removed rear section of the base is typically bent to a 90-degree angle and positioned below the rear of the display base. The ridges and valleys of the upturned rear portion of the base provide vertical support for the rear portion of the row dividers. In this embodiment, a partition divider typically rests in a selected valley with the bottom of the divider positioned in the horizontal portion of the valley, and the rear portion of the divider positioned in at least a portion of a valley on the upturned rear section.

A pull member such as a strap, a rod, a spring coil, or an elastic band may be placed in a

channel formed between ridges. The pull member may be manually pulled outward from the display shelf, or may automatically keep merchandise moved toward the front of the display shelf by constant force such as a spring or elastic band.

Advantages of the current invention include the low cost of the display base, such as provided by thermoforming or vacuum molding the base, efficient packaging, and low shipment cost. The base is also very easy to cut to desired size and to install on a shelf without special tools. The base can typically be cut with scissors or a box knife. The base will work with various display shelf depths, and with various sizes of merchandise including product containers such as cans, bottles, and bags.

In one embodiment, the display base includes a plurality of display rows which each have a pre-determined width to accommodate a specific size of product container. For instance, in the case of soup cans, the base may have a set of rows which are each the same width. In other cases, adjacent rows may have different widths to accommodate different sized containers.

The rows typically have two ridge dividers, one on each side of the row, such that the dividers engage a portion of the lower part of the product containers in order to keep the containers in the row.

In one embodiment, the center of each row has a single recess channel which holds a pull member. The pull member may be a thin plastic strip which is bent upwards at its rear end in order to engage the rear product container in the row. In one embodiment the rear of the pull strap includes a pull plate for engaging the product containers. The front end of pull strap typically protrudes slightly from the front of the display base so that it may be grasped and pulled outward to align the product containers in the row. After alignment, the pull strap is returned to its resting position with the rear of the strap near the rear of the display shelf, and the front of the

pull strap protruding slightly from the front of the shelf. In other embodiments, the pull member may be a rod, bar, or elastic member.

In another embodiment, two recess channels may be provided in a row, and the pull device includes two elongated members which rest in the channel. The rear of the elongated members may be attached to a pull plate to engage the back of the product containers, and the front of the members may be attached to a handle. The product alignment proceeds as in the single channel embodiment by grasping the handle, pulling the handle outwards from the display shelf until the containers are aligned, and returning the handle to its rest position.

Inventory, such as restocking is assisted by observing the length of the pull device, which provides a measure of available display space behind the containers. In this way, the stocker does not need to visually observe the row depth, and the shelf height can be lower than what is required for visual inspection.

#### BRIEF DESCRIPTION OF THE SEVERAL VIEWS OF THE DRAWING

FIG. 1A is a top view of an embodiment of a display base having one pull channel per display row.

FIG. 1B is a detailed top view of the embodiment shown in FIG. 1A.

FIG. 1C is a cross sectional view of two rows of the display base shown in FIG. 1A.

FIG. 1D is a top perspective view of a pull strap.

FIG. 1E is a top view of the depth adjustment area of the display base shown in FIG. 1A.

FIG. 2A is a top view of an embodiment of a display base having ridge product container supports in each display row.

FIG. 2B is a detailed top view of the embodiment shown in FIG. 2A.

FIG. 2C is a cross sectional view of two rows of the display base shown in FIG. 2A.

FIG. 2D is a cross sectional view of another embodiment of two rows of the display base shown in FIG. 2A.

FIG. 2E is a cross sectional view of another pull member embodiment of two rows of the display base shown in FIG. 2A.

Fig. 3A is a top view of an embodiment of a display base having slots for placement of divider wall inserts

Fig. 3B is a detailed top view of the base in Fig. 3A.

Fig. 3C is a cross section view of the embodiment of Fig. 3A.

Fig. 4A is a cross section view of an embodiment for baby food jars.

Fig. 4B is a detailed cross section view of the embodiment of Fig. 4A.

Fig. 4C is a cross section view of an embodiment for baby food jars including tall row dividers.

Fig. 4D is a perspective view of stacked containers such as baby food jars.

Fig. 5 is a cross sectional view of a pull strap bent upwards behind a stack of containers.

Fig. 6 is a perspective view of a pusher element attached to a pull strap.

Fig. 7 is a perspective view of a display section with front stops.

FIG. 8 is a detailed cross section view of an end stop inserted on a display base.

FIG. 9A is a top perspective view of an embodiment of a display base having a plurality of support ridges with alternating scoring in the rear portion of the base.

FIG. 9B is a detailed cross section view of the embodiment shown in FIG. 9A further showing insertion of dividers.

FIG. 9C is a detailed cross sectional view of the rear portion of the display base shown in FIG.

9A showing scoring and alternating notching for depth adjustment.

FIG. 9D is a top perspective view of the display base of FIG. 9A with a rear portion excess removed and attached to the base, with dividers inserted, and with a pull member.

FIG. 9E is a detailed cross section view of the display base of FIG. 9D showing the attachment of the rear portion to the base.

5 FIG. 9F is a detailed cross section view of the display base showing a hinge line.

FIG. 10 is a top perspective view of a display base with pull members, a pusher element, and spring pushers.

FIG. 11A is a perspective view of a pusher element with a spring pull member inserted and engaging the pusher element.

10 FIG. 11B is a cross section view of a pusher element with a spring pull member inserted and engaging the pusher element.

FIG. 11C is a perspective view of a pusher element with a pull member inserted and pushed away from the pusher element.

FIG. 12 is a cross section view of an elastic pull member.

15 FIG. 13A is a top perspective view of the bottom surface of an embodiment of the invention.

FIG. 13B is a detailed top perspective view of a snap feature of a first base unit of the embodiment of FIG. 13A.

FIG. 13C is a detailed top perspective view of a snap feature of a second base unit of the embodiment of FIG. 13A.

20 FIG. 14A is rear perspective view of a front stop element.

FIG. 14B is side view of a front stop element and base unit on a display shelf.

FIG. 15 is a top perspective view of various types of pull devices used with the base unit.

FIG. 16A is a front perspective view of an active alignment device with a spring loaded rear



engagement member.

FIG. 16B is a detailed rear perspective view of the rear engagement member of FIG 16a.

FIG 16C is a detailed side view of the rear engagement member in the device of FIG. 16A.

FIG. 16D is a detailed rear perspective view of the front stop.

5 FIG. 17A is a front perspective view of an active alignment device with an elastic member.

FIG. 18A is a front view of sidewall dividers in a base in a first configuration.

FIG. 18B is a front view of sidewall dividers in a base in a second configuration.

FIG. 18C is a front view of sidewall dividers in a base in a third configuration.

FIG. 18D is a detailed view of a sidewall divider showing an offset.

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# DETAILED DESCRIPTION OF EMBODIMENT – Display base and pull straps for grocery display

Referring now to Fig. 1A which is a top view of an embodiment of the current invention, several containers **80a- 80i**, such as soup cans are placed in one row **50** of a display base **10**.

15 Alternate embodiments support other sizes of cans, boxes, bags, and loose merchandise.

In this embodiment, the base may be a plastic sheet which may be bent or scored along one of several depth adjustment lines **91-97** at the rear of the base. This permits the base to be sized for standard grocery store shelf depths of 18, 19, 20, 21, 22, 23, or 24 inches. The rear of the base may be either bent up or may be bent and scored or cut to remove the excess material.

20 The bending is typically performed by laying the base upside down and backwards on a shelf so that the base may be bent at an appropriate bend line. After bending, the extra base material may be left in a bent position or may be removed such as by cutting it off with a box blade.

The channel **40** is defined by the lower portion of the portion of the base **10** which lies between the support ridges **30**. Each row **50** of the base **10** is defined by a row ridge divider **20** on either side the rows. The divider may be separated from the support ridge as shown in Fig 1B, or the divider may be integral to the support ridge.

5 Referring now to Fig. 1B, which is a detailed top view of one side of a row and an adjacent row, the ridge divider **20** may be pyramidal in shape, and the support ridges **30** are raised from the floor of the base.

Referring now to Fig. 1C, which is a cross sectional view of two rows of the base, the ridge dividers **20** are shown as triangular cross sections having a angle of approximately  $25^\circ$  from the vertical line bisecting the ridge divider, so that the top angle of the ridge dividers is about  $50^\circ$ . The ridges **30** are typically raised about  $1/8''$  above the top of the channel **40**. The ridge dividers have an additional height of about  $5/16''$  above the ridge height, for a total height of about  $9/16''$ . In this case the rows are sized for soup can containers **80a** and **80b** and have a distance between the ridge divider peaks of  $2\ 5/8''$ . In this embodiment, each row further

15 comprises a ridge **30** on each side of the row. The ridges **30** form a channel **40** which is used to support a pull strap **200**. The channel **40** permits a pull member such as a pull strap to rest underneath the product containers **80a- 80b** until the front of the pull member is grasped and pulled away from the shelf in order to bring the rearmost containers forward and align the containers toward the front of the shelf on the display base **10**.

20 Referring now to Fig. 1D, which is a top perspective view of a pull strap **200**, the pull strap is typically about 26 inches long, and may be cut to a shorter length. It is typically fabricated of a plastic material in a color similar or complimentary to the color of the base. The front end **201** of the pull strap may be bent upward to provide a grasping point in order to pull the

strap forward. Typically, the rear of the pull strap maybe bent upward in order to engage the rear of the product containers. In other embodiments, the rear of a pull member may be connected to a larger rear container engagement member.

Referring now to Fig. 1E, which is a top view of the depth adjustment area of the display base, from the rear **90** of the product base there are a series of lines, preferably at 1" intervals. These lines **91, 92, 93, 94, 95** permit the base unit to be bent or cut to a desired width. These depth adjustment lines **91-95** are formed by interrupting the ridge **30** and the divider **20** so that the base may be folded or cut in a straight line across at the desired depth. The lines **91-95** permit the appropriate depth, such as grocery to be selected. Typically the base unit is laid on the shelf backwards, bent at the front edge in a downward motion and then the excess material may be cut such as with a box blade knife. In other embodiments, the depth adjustment lines may be alternated between ridges in order to strengthen the base. In other embodiments, a flat portion of the base is provided at the rear of base so that the removed portion may be bent and inserted so that the flat portion rests beneath the display base.

#### DETAILED DESCRIPTION OF EMBODIMENT – alternate ridge arrangement

Referring now to Fig. 2A, another embodiment provides a base **12** with a plurality of rows **52** defined by row ridge dividers **20a** and **20b** as shown in more detail in Fig. 2C.

Referring now to Fig. 2B, which is a detailed view of a row divider ridge and support ridges, the outer ridge **32** and the inner ridge **34** define a recess **33**.

Referring now to Fig. 2C, which is a detailed cross sectional view of two rows, each row of this embodiment is defined by a first row ridge divider **20a** and a second row ridge divider

**20b.** Each row includes a pair of outer ridges **32a** and **32b**, and a pair of inner ridges **34a** and **34b**. A center channel **35** is formed between the inner ridges **34a** and **34b**.

One advantage of multiple ridges is a rib strengthening effect. A second advantage of a center channel **35** is that the center channel may typically be 7/8" wide to provide room for a 3/4" wide pull strap to reside in the channel. As in the previous embodiment, the containers **80a** and **80b** reside on the ridges **32a-b** and **34 a-b** which support the containers off the base so that the pull strap may be placed in the center recessed channel **35**. The ridge dividers **20a-b** keep the containers in the row, and prevent the containers from moving laterally. In this embodiment, the first ridge **32a** has a preferred width of about 0.5 inches.

In many cases, row divider ridges **20a** and **20b** may be designed to fit into the recesses between adjacent rows of merchandise. This type of row division is often desirable in order to conserve valuable shelf space.

In some embodiments these channels between the inner and outer ridge support two-rail pull devices. Referring now to Fig. 2D, which is a cross section view of a two-rail pull device positioned in a row of a base, channel **33a** is located between the left outside ridge **32a** and the left inner ridge **34a**. The left rail **205a** of a two-rail pull member is positioned in the left channel **33a**. Channel **33b** is located between the right outside ridge **32b** and the right inner ridge **34b**. The right rail **205b** of a two-rail pull member is positioned in the right channel **33b**. The two-rail pull member typically includes a rear engagement section such as a plate or bent rails, and a front pull handle connecting the rails.

Referring now to Fig. 2E, which is a cross section view of an alternate two-rail pull device positioned in a row of a base, channel **36a** is located between the left outside ridge **32a** and the left ridge **20a**. The left rail **205a** of a two-rail pull member is positioned in the left

channel **36a**. Channel **36b** is located between the right outside ridge **32b** and the right ridge divider **20b**. The right rail **205b** of a two-rail pull member is positioned in the right channel **36b**.

#### DETAILED DESCRIPTION OF EMBODIMENT – divider wall inserts

5 Referring now to Fig. 3A, another embodiment of the base unit provides for placement of divider wall inserts **23** into the divider recesses. Multiple rows **54** are provided in the base unit **14**. As shown in Fig. 3B, each row includes ridges **32a** and **32b** on either side of the row dividers **22**, and includes a recess **24** for the placement of a divider wall insert **23**. This arrangement enables the base unit to be fabricated and the inserts to be chosen depending upon  
10 the anticipated product container height or stacked height. In other embodiments, the divider may be flattened and serve as a support ridge, so that additional ridges are not required for the container support.

Referring now to Fig. 3C which is a cross section of the embodiment of Fig. 3A, the row **54** includes a center channel **40** defined by ridges **32a** and **32b** on either side of the channel. The  
15 containers **80** also reside on a flat portion of the ridge dividers **22**. The ridge dividers **22** include a recess **24** for receiving a divider wall insert **23**. In one embodiment, the distance between the divider wall inserts **23** is  $2 \frac{3}{8}$ " to accommodate soup cans. The divider wall inserts for soup cans are preferably  $\frac{3}{8}$ " tall with  $\frac{1}{8}$ " residing in the gap **24**, and an additional  $\frac{1}{4}$ " extending  
20 above the top of the ridge divider **22**. The top width of the ridges **32a** and **32b** is typically  $\frac{1}{4}$ " with a  $\frac{1}{4}$ " gap between the ridge dividers **22** and the ridges **32**. Eight rows of soup cans may be provided in a base having an overall width of approximately 21.94" inches, which leaves a small base area on either side for placement of an overlapping unit in order to extend the overall width of the display bases.

## DETAILED DESCRIPTION OF EMBODIMENT – baby food jar display

Referring now to Fig. 4A and 4B, which is an embodiment specifically for baby food jars **81a-81c**, rows **50** are provided having a width of  $2 \frac{5}{16}$ ". The rows include pull strap channels **40** to permit a pull strap **200** to be placed under rows of product container **81b**. The baby food jars are supported above the pull strap channel **40** with raised support ridges **30** which have a preferred height of about  $\frac{1}{8}$ ". The pull strap is preferably  $\frac{3}{4}$ " wide and .050" thick, and is made of a plastic such as PVC. The support ridges have a width of  $\frac{1}{4}$ " and the recessed channel **40** has a width of  $\frac{7}{8}$ " to accommodate a  $\frac{3}{4}$ " wide pull strap. The ridge dividers **20** have a peak angle of  $50^\circ$ , which represents  $25^\circ$  on either side of a vertical through the apex of the peak. The height of the ridge divider **20** is preferably  $\frac{7}{16}$ ". In this embodiment, the ridge dividers are positioned in the space created by the rounded bottom of the baby food jars. In one embodiment, ten rows of baby food containers are provided on a base having an overall width of  $23 \frac{1}{8}$ ". The edges of this display base are flat, so that additional base units may be placed in an overlapping manner over the end ridge divider in order to extend the overall width of the display base.

Referring now to Fig. 4C, an alternate arrangement for baby food jars is shown. The center channel **40** and pull strap **200** are defined as before. The ridge dividers in this embodiment include a recess **24** which may receive a tall divider **23** which may be approximately 6" high in order to prevent a stack of three baby jars from collapsing to one side. Alternate tall divider partition heights may be used for alternate container stack heights.

Referring now to Fig. 4D, which is a perspective view of stacked containers such as baby food jars, the tall dividers **23** are shown placed in the divider recess **24**. Stacks of product containers **82a-82c** here are shown at the rear of the display rows **50** and may be pulled forward.

In one embodiment, the pull strap is simply bent upwards to form a rear product engagement member **202** (as detailed in Fig 5). In another embodiment, the rear section of the pull strap is connected to a pusher element **260** in order to engage the stack of containers (as detailed in Fig 6). The containers may be placed within rows with or without divider inserts **23**.

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#### DETAILED DESCRIPTION OF EMBODIMENT – pull strap

Referring now to Fig. 5A, which is a cross sectional view of a stack of containers such as baby food jars, the rear of the pull strap unit **202** may be bent upward in order to engage the stack of containers. Alternately, a separate pusher element **260** may be attached to the pull strap. The front of the pull strap **201** is bent upward slightly in order to provide a grasping point to pull the product container rows forward. After the units have been pulled to the front of the shelf, the pull strap may be pushed back into the position so that the rear is near the rear of the shelf and the front bend **201** is near the front edge of the display base.

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#### DETAILED DESCRIPTION OF EMBODIMENT – pull strap with pusher element

Referring now to Fig. 6, which is a perspective view of the attachment of a pusher element **260** to a pull strap **200**, the strap may be placed through notch **262** (not shown) on the back stop and then the pull strap may be bent forward.

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#### DETAILED DESCRIPTION OF EMBODIMENT – overlapping base sections

The display base may be provided in a length which will accommodate several rows of merchandise. Display base sections may be partially overlapped to extend the base length on a shelf. In other embodiments, display sections may be arranged side-by-side without overlapping.

## DETAILED DESCRIPTION OF EMBODIMENT – front stops

Referring now to Fig. 7, which is a perspective view of a section of a baby food jar display, a front stop **300** is provided in order to restrain product containers from being  
 5 accidentally pulled out of their display row.

Referring now to Fig. 8, which is a cross section view of a section of a front stop inserted on a display shelf, the stop **300** may clip onto the front portion of the shelf **9**.

In one embodiment, the front stop is molded with the base as a hollow wall section. This double wall arrangement provides additional strength to the stop. A slot **302** (not shown) is cut  
 10 in the rear wall of the stop, and a larger opening **304** is cut in the front of the stop. A pull strap **200** is placed through the front and rear openings.

In another embodiment, the front stop may be a single wall which is molded with the base unit.

In another embodiment, the front stop may be fabricated separately and then attached to the  
 15 base unit as a single stop or as a row of stops.

## DETAILED DESCRIPTION OF EMBODIMENT – display base

Referring now to Fig. 9A which is a top perspective view of an embodiment of a display base **16** having a plurality of support ridges **38** with alternating scoring in the rear portion **17b** of  
 20 the base, the display base has a plurality of ridges **38**. The ridges reinforce the base, which may be a relatively thin plastic molded or thermoformed sheet. The ridges also support merchandise to be displayed such as grocery cans, boxes, bottles, or sacks.

Referring now to FIG. 9B, which is a detailed cross section view of the embodiment



shown in FIG. 9A, dividers **26** may be inserted between base ridges **38** in order to create desired product display rows. In this figure a display row is defined as the area between the first divider **26a** and the second divider **26b**.

Referring now to FIG. 9C, which is a detailed cross sectional view of the rear portion of the display base shown in FIG. 9A, the ridges are notched to facilitate cutting the base to a desired shelf depth. In one embodiment, the base includes lateral scoring at the base of the notches so that the base may be more easily bent or cut to a desired depth.

In this embodiment, the notches are made on every other ridge in an alternating fashion. For instance, the first ridge, and other odd-numbered ridges, may be notched at intervals of 18", 20" and 22" from the front edge, notches **39a**, **39b**, and **39c** respectively; while the ridge and even-numbered ridges may be notched at 19", 21", and 23" from the front edge of the base, notches **39f**, **39e**, and **39c** respectively. For instance, if the base were to be cut, 20" from the front edge, the base would be bent along the 20" notches **39b** and corresponding score line and then cut. The notches provide a cutting guide across the base. In this embodiment, the base includes a flat rear portion **17b** which may be removed along with the extra ridge length when the base is cut to the desired depth. The removed portion of the base may be bent and positioned at the rear of the remaining base so that the flat portion rests under the rear of the remaining base.

Referring now to FIG. 9D, which is a top perspective view of the display base of FIG. 9A with a rear portion excess of the base removed and attached to the base, with dividers inserted, and with a pull member. The rear support section **60** is formed by attaching the cut off portion of the base to rear edge of the shortened base. The rear section includes ridges such as **61a**, **61b** which support the divider.

Referring now to FIG. 9F, which is a detailed cross section view of a portion of the rear

of the display base, a hinge line **17c** may be included to facilitate bending the rear portion **17b** with respect to the front section **17a** of the base.

Referring now to FIG. 10, which shows a variety of pull schemes for the display base **16**, the base may include pull members such as pull straps **200**, springs **270**, or elastic bands. Figs 11A and 11B shows a pull member including a pull strap **200** which pulls a rear engagement member **260** forward as the pull strap is pulled forward. Fig 11C shows a spring **270** coiled behind a rear engagement member. Fig 12 shows an elastic band **280** with a rear engagement member **260**. The band may be secured by tie points **282b** at the rear of the shelf and **282a** on the pusher element.

#### DETAILED DESCRIPTION OF EMBODIMENT – extruded display base

FIG. 13A is a top perspective view of the bottom surface of an embodiment of an extruded plastic display base **16** having a plurality of support ridges **38**. In one embodiment, the width of the extruded base sections is 4-5 inches. In other embodiments, various section widths narrower or wider than the 4-5 inches may be used as desired. These embodiments are not limited to extrusion manufacturing, but extrusion is typically a low cost method of manufacturing such units in high volume. A manufactured width is typically selected as a tradeoff between extrusion mold costs and the desired application.

Several of the units are typically arranged in an overlapping fashion on a display shelf. The base units may include a lock joint on one or both end rows such that the offset allows one base section to snap onto another base section. FIG. 13B is a detail of one embodiment of a lock joint **400** which snaps over a corresponding lock joint **401** in FIG. 13C. A plurality of these modules may be overlapped in this manner in order to cover a wide display shelf.

The base unit may further include dado or similar cuts **405** in the bottom of the front

portion to accept a front stop that can snap into position on the base.

Referring now to FIG. 14A, which is a detail of a front stop 410, and FIG 14B, which is a side view detail, the front stop may include a vertical retaining member 411 which may include a vertical cutout section 412 to accept a pull member (not shown), a horizontal leg section 413 which may include a cutout section 414 to accept the pull member and a rear base engagement lip 416 which nests in the cutout portion of the bottom base ridges 405.

The base unit may also include cuts 420 at intervals along the in the bottom rear of the base to facilitate cutting the base to a desired shelf depth as discussed in the examples above.

Referring now to FIG. 15, various types of pull devices as illustrated by 430 and 440 may be employed in cooperation with the base. The pull units typically include a handle or front section 431, 441 that may be grasped by a user, at least one elongated member 432, 442 which may be positioned within or substantially within a trough of the base section, and a rear engagement member 433, 443. The rear engagement member may be a bent-upwards portion of the elongated member 443, or may include a plate 433 or additional element affixed to the rear of the elongated member.

#### Detailed Description of Embodiment- Spring tensioned rear member

In some embodiments, a spring or elastic member may be used to provide a force to assist in drawing items toward the front of a display row.

Referring now to FIG. 16A which is a front perspective view of an active alignment device comprising a housing spring and rear engagement embodiment, the rear engagement section 450 may permit a pull spring 460 to push the display row forward relative to the base unit 16. In one embodiment, one end of a coiled spring 460a is held relative to the front stop 480, and

the other coiled end 460b of the spring is placed behind the rear pull member 450. The rear engagement section may travel in a channel housing 470 which has a first leg 473 inserted in a first groove and a second leg 474 inserted in a second groove of the base 16.

Referring now to FIG. 16B which is a detailed rear perspective view of the rear engagement member and FIG 16C which is a detailed side view, in one embodiment, the rear engagement member 450 includes a first slide member 451 and a second slide member 452 which travel in channel 471 and 472 of the housing. The rear engagement member may include an engagement member 455 and a spring retention member 456. The spring retention member may include a slot 457 for affixing an alternate elastic pull member.

Referring now to FIG. 16D which is a detailed rear perspective view of the front stop 480, the front stop may include projections 482 which can be inserted into grooves of the base 16, a projection 483 which may be inserted into the housing channels 471 and 472, and a front cover plate 481. The front stop may also include a slot 484 for attaching the first end of a coiled spring or elastic member.

In this example, the active alignment device may have a first slide rail 473 which travels in a first trough in the base unit, and a second slide rail 474 which travels in a second trough in the base unit. The pull unit may include a product engagement member 450 spaced apart from a spring engagement member 456. This spaced-apart arrangement provides stability for the rear engagement member. As described above, spring or elastic elements may be provided with a display device to pull forward products arranged in a display row.

#### Detailed Description of Embodiment- elastic tensioned rear member

In some cases, more force may be required to pull product forward than can be practically

provided with a coil spring and rear sled assembly. Referring now to FIG. 17A which is a front perspective view of an active alignment device with an elastic member, an active alignment device 500 may be positioned in troughs on the base. In one embodiment, the active alignment device 500 includes a slide support frame 470, a front stop 480, a rear band anchor 495, an elastic strip 492 or band, and a rear engagement member 450 which slides in the slide support frame 470. The active alignment device may also include an idler sheave 490 or other device for permitting the elastic band to pull around the front stop. In one embodiment, the first end 493 of an elastic strip 492 is fixed relative to the rear band anchor 495. The elastic strip is wrapped partially around the sheave 490, and the second end of the strip is affixed to the rear engagement member 495 so that as the elastic strip contracts, the rear engagement member 450 is pulled toward the front stop. The slide support frame includes a first lower rail section 473 which is positioned in a first trough in the base unit, and a second lower rail section 474 which is positioned in a second trough in the base unit. In this embodiment, the first lower rail section and the second lower rail section may be snapped into the base section. In this embodiment, the elastic strip forces the rear engagement member forward toward the front stop, thereby aligning items in the display row.

Referring now to FIG. 18, sidewall divider sections such as 501 and 511 may be included with the base. In one embodiment, these dividers have a base portion 502 and 512 which is preferably slightly wider than the trough width in a base section, such that the base portion may be snapped into place in a trough. In one embodiment, the dividers include a wall section 503 and 513 that is thinner than the width of the base portion of the divider, and where the wall is attached to the base portion asymmetrically with respect to the center line of the base portion. This asymmetry permits a divider to be positioned in a first position which is narrower than a

second position as indicated by FIGs 18B and 18C. By selecting either the first orientation or the second orientation for the sidewall divider sections on both sides of a display channel 520, the width of the channel can be adjusted to a desired distance.

For instance, in one embodiment, the base unit has a nominal inside trough diameter of 1/8" and trough depth of about 1/4 inch, and the sidewall divider section has a base section width of about 1/8" to create press fit, and a wall thickness of about 1/16". As illustrated in FIG. 18D, a first wall surface 505 of the sidewall divider section 503 is substantially flush with the first base section wall 504, so that there is an offset distance of about 1/16" from the second wall surface 506 to the second base section wall 507. Therefore when the wall is reinserted into the slot in the second orientation, the width of the display channel 520 is increased by this offset distance. For example in FIG. 18A, the display channel has a first width which corresponds to both dividers being inserted in the same orientation. In FIG. 18B, the display channel has a second narrower width which corresponds to both dividers being inserted where the offsets are oriented outwards. In FIG. 18C, the display channel has a third wider width which corresponds to both dividers being inserted where the offsets are oriented inwards.

These embodiments are examples of the invention and it is evident that those skilled in the art can make variations without departing from the inventive concepts, and the invention should be limited solely by the spirit and scope of the claims.